BULLETIN SYNOPSIS

Climate Change and Wildlife

PART I: IMPACTS & MANAGEMENT CONSIDERATIONS

SYNOPSIS / FEBRUARY 29, 2016 / BY JENNIFER HUSHAW

Climate change may soon outmatch traditional human influence as the biggest driver of biodiversity change in the coming century. Conserved and managed forestlands will be a key part of efforts to protect or enhance these resources.

This overview piece is the first in a two-part bulletin—part two will summarize anticipated climate impacts and management considerations for a number of key species in North America.

General Wildlife Impacts

There will be *direct* impacts through changes in temperature and water availability and *indirect* impacts via effects on food sources, associated species, and habitat conditions. Some organisms will certainly benefit from the coming changes, while others may decline or even go extinct. The major ways climate change will affect wildlife include:

- Transforming habitat
- Shifts in timing/seasonal changes
- Range shifts/migration
- Spreading pests and disease

What makes species resilient?

The least at-risk species will be generalists that have a broad geographic range and tolerance level, high degree of plasticity and genetic variability, short life cycle, high fertility, and good dispersal capability.

As conditions change, many species will find that their current habitat is outside their climate niche—the full range of temperature and precipitation conditions in which they normally occur—and in order to adapt they must change **where**, **when**, or **how** they operate, but the rate of climate change may be faster than the pace at which many can adapt.

Observed Changes

Syntheses of the literature on species ranges, abundance, and phenology indicates that climate change has already left a discernable fingerprint on the Earth's biodiversity. In fact, the IPCC concluded (with high confidence) that: "Many terrestrial, freshwater, and marine species have shifted their geographic ranges, seasonal activities, migration patterns, abundances, and species interactions in response to ongoing climate change."

Model Projections

A large fraction of species face extinction risk that will increase with the magnitude and rate of climate change. Slower, natural climate changes in the Earth's past led to major ecosystem shifts and extinctions, so we expect to see similar processes at work under current warming.

There will be significant time-lags in species response (e.g. decades to centuries for vegetation), which can make it easy to underestimate the amount of change at any given time.

Management Considerations

Climate change should be an explicit consideration when setting conservation and wildlife management priorities—not just the continuous and direct impacts, but extreme events and indirect impacts as well.

Management strategies that can promote resilience of wildlife populations, include: increasing connectivity, reducing non-climatic stressors, planting less climate-sensitive species, increasing heterogeneity, and protecting refugia. For a more complete list, see the full bulletin.

Note: See the full bulletin for a discussion of the potential tradeoffs between managing for carbon benefits or wildlife.

Click on the sub-headings above to go directly to the corresponding section of the full bulletin, or read the complete bulletin online: http://climatesmartnetwork.org/2016/02/climate-change-wildlife-impacts-part-1/